RESEARCH CALL TO DOE LABORATORIES

U. S. Department of Energy

Office of Fossil Energy

National Energy Technology Laboratory

Technical Support for Advanced Air Separation Concepts and Technologies for the Production of Oxygen

Issue Date: **06/15/2018**

Proposal Due Date: **07/16/2018 at 11:59:59 PM Eastern Time**

This Research Call will remain open until the Proposal Due Date indicated above. However, proposals may be submitted at any time before this Lab Call closes. Proposals are to be submitted to AirSeparation.LabCall@netl.doe.gov**.**

SECTION I – RESEARCH CALL DESCRIPTION

A. SUMMARY

The Department of Energy's (DOE) National Energy Technology Laboratory (NETL) on behalf of the DOE, Office of Fossil Energy, is seeking proposals from the DOE National Laboratory Complex, which will focus on identification of new concepts and technologies for production of oxygen via air separation for use in flexible, modular coal-based gasification systems. Projects proposed under this Research Call must not place the Laboratory in direct competition with the private sector.

B. BACKGROUND

The mission of DOE's Clean Coal Program is focused on developing advancements in technology that increase the performance, efficiency and availability of existing and new coal-fueled power generation to provide the United States with the best opportunity to maximize the full potential of its abundant fossil energy resources in an environmentally sound and secure manner. The Advanced Energy Systems (AES) program focuses on improving the efficiency of coal-based power systems, increasing plant availability, and maintaining the highest environmental standards.

The Gasification Systems Program element of the AES Program is developing advanced technologies to reduce the cost and increase the efficiency of producing coal syngas in modular systems. The Radically Engineered Modular Systems (REMS) concept exploits the idea that cost reductions can be realized via mass production and learning curve effects in lieu of traditional scale-up. These technologies should enable market-optimized designs and strategies for gasification-based energy conversion plants, which can be flexibly right-sized, configured and sited for local coal, waste coal and coal fines, and other low-cost opportunity feedstocks for conversion to high-value marketable products. Modular coal gasification systems could create a synergism of co-utilizing low-cost opportunity feedstocks to synthesize products targeted to local market dynamics.

Engineering design of smaller coal syngas-producing reactors and streamlined processes may enable highly efficient and low carbon footprint power generation. Improved performance of reactors for gasification, syngas upgrading and cleanup, and conversion of syngas into power will enable low-cost and highly energy-efficient systems with excellent environmental performance. The development of modular air separation technology to supply the oxidant feed to an oxygen-blown REMS gasifier is urgently needed to achieve the program goals.

Areas considered outside the scope of this Research Call, and will be considered non-responsive, include, but are not limited to:

- Oxygen production via methods other than air separation
- Approaches utilizing water splitting to produce oxygen

C. OBJECTIVE

The objective of the 2018 Laboratory Research Call is to solicit and competitively award research projects to develop air separation technologies to be utilized in advanced fossil energy based modular energy systems that will make substantial progress toward enabling cost-competitive, coal-based power generation with near-zero emissions. Air separation technologies developed under proposals selected through this Laboratory Research Call would eventually find applications in a coal-fed relatively small scale (1-5 MWe)

modular gasification-based power plant.

D. TOPIC AREA: Modular Oxygen Production

This topic area focuses on identification of new concepts and technologies for production of oxygen via air separation for use in flexible, modular gasification systems. Oxygen production/air separation technologies must target both low cost and high levels of operational efficiency relative to state-of-the-art technology, capability to produce oxygen having 90-95 vol% purity, and be suitable for utilization in small-scale modular power plants ranging from 1-5 MWe.

Applicants may propose technological advancements for air separation using any suitable methods such as cryogenic, sorbent-based, membrane-based, chemical-based, hybrid approaches, and novel approaches to oxygen production via air separation. Applicants are encouraged to leverage low-cost materials, advanced manufacturing methods, modeling/simulation, and other efficiency increasing and cost-reducing R&D approaches. Laboratories may submit more than one proposal.

SECTION II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

Awards will be issued through the Approved Funding Program based on a Field Work Proposal (FWP) or other allowable instrument deemed appropriate by the Government.

B. ESTIMATED FUNDING

Approximately $4.0 million is available to fund year 1 of these awards under this Research Call. The Government reserves the right to fund the proposed Government share, in whole or in part, on any, all, or none of the proposals submitted in response to this Research Call and will award that number of projects which is in the best interest of the Government.

C. EXPECTED NUMBER OF AWARDS

DOE expects to make 3-5 awards under this Research Call.

D. ANTICIPATED AWARD SIZE

DOE anticipates that it will issue 3-5 awards ranging from $800,000 -$1,000,000 per award for the first year with options to continue these efforts up to $1,000,000 per award per year for an additional 3-4 years. Only the first year of work will be funded at this time, and additional funding is contingent upon the availability of appropriated funds and progress towards meeting the objectives of the award.

E. PERIOD OF PERFORMANCE

DOE anticipates making awards within 90 days from the date of the release of the Research Call with an anticipated performance period of up to 5 years.

F. TYPE OF PROPOSAL

DOE will accept only new proposals under this Research Call and not any request for renewal of a current project.

SECTION III – ELIGIBILITY INFORMATION

A. ELIGIBLE OFFERORS

Only DOE National Laboratories are eligible to apply under this Laboratory Research Call.

NETL is not considered eligible for an award under this Laboratory Research Call.

SECTION IV – PROPOSAL AND SUBMISSION INFORMATION

A. CONTENT AND PROPOSAL FORMS

Prepare and submit the following files as per the instructions provided below to the email address AirSeparation.LabCall@netl.doe.gov.

1. REQUIRED FILES

1A. Project Summary/Abstract – (File name: Abstract.pdf)

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the National Laboratory, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public after awards are made. The project summary must not exceed 2 pages when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) single spaced with font not smaller than 11 point.

1B. Project Narrative File – (File name: Narrative.pdf)

The Project Narrative **must not exceed 25 pages,** including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when printed using standard 8.5" by 11" paper with 1-inch margins (top, bottom, left, and right) doubled spaced with font not smaller than 11 point. EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. Do not include any Internet addresses (URLs) that provide information necessary to review the proposal. See Part VIII.D for instructions on how to mark proprietary proposal information.

The project narrative file must include the following information that **WILL** count in the Project Narrative page limitation:

-**Project Objectives**: This section shall provide a clear, concise statement of the specific objectives/aims of the proposed project.

-**Merit Review Criterion Discussion**: The section should be formatted to address each of the merit review criterion and sub-criterion listed in Section V.A. Provide sufficient information so that reviewers will be able to evaluate the proposal in accordance with these merit review criteria. DOE WILL EVALUATE AND CONSIDER ONLY THOSE PROPOSALS THAT ADDRESS SEPARATELY EACH MERIT REVIEW CRITERION AND SUB-CRITERION IN THE PROJECT NARRATIVE SECTIONS AND THE STAND-ALONE PROJECT MANAGEMENT PLAN (PMP).

-**Relevance and Outcomes/Impacts**: This section shall explain the relevance of the effort to the objectives in the Research Call and the expected outcomes and/or impacts.

-Organizational Structure and Management: This section shall specifically identify key personnel and a discussion of how the organizational structure will facilitate the performance of the tasks described in the Statement of Project Objectives, including the Project Management activities of monitoring and controlling project scope, cost, schedule and risk. Include a discussion of how communication and decision-making will occur within the context of the laboratory structure and a discussion of how

intellectual property issues will be addressed. An Organizational chart must be provided.

-Statement of Project Objectives (SOPO): The project narrative must contain a single, detailed Statement of Project Objectives that addresses how the project objectives will be met. The Statement of Project Objectives must contain a clear, concise description of all activities to be completed during project performance and follow the structure discussed below. The Statement of Project Objectives may be released to the public by DOE in whole or in part after award. It is therefore required that it shall not contain proprietary or confidential business information.

The Statement of Project Objectives is **generally less than 10 pages** in total for the proposed work. Prepare the Statement of Project Objectives in the following format:

*****BEGINNING OF SOPO FORMAT******

TITLE OF WORK TO BE PERFORMED (Insert the title of work to be performed. Be concise and descriptive.)

A. OBJECTIVES
Include one paragraph on the overall objective(s) of the work.

B. SCOPE OF WORK
This section should not exceed one-half page and should summarize the effort and approach to achieve the objective(s) of the work.

C. TASKS TO BE PERFORMED
Tasks and subtasks, concisely written, should be provided in a logical sequence. This section provides a brief summary of the planned approach to this project. An outline of the Project Management Plan (referenced in Task 1.0 below and required to be submitted with your application) is provided later in this Section.

Task 1.0 - Project Management and Planning

[NOTE: the following text is required verbatim]

This Task shall include the necessary activities to ensure coordination and planning of the project. These activities shall include, but are not limited to, the monitoring and controlling of project scope, cost, schedule, and risk. This Task shall also include all work elements required to maintain and revise the Project Management Plan, and to manage and report on activities in accordance with the plan. An updated Project Management Plan shall be submitted within 30 days of the award.

Subtask 1.1
(Description)

Task 2.0 - (Title)

Task 3.0 - (Title)

ETC…

D. DELIVERABLES
[NOTE: the following text is required verbatim]
The Laboratory will include the following reporting requirements as part of the deliverables list and will

be submitted to the Federal Project Manager.

- Quarterly Reports
- Comprehensive Final Report

[Note: The Laboratory shall provide a list of deliverables other than those identified above that will be delivered. These reports shall also be identified within the text of the Statement of Project Objectives.]

E. BRIEFINGS/TECHNICAL PRESENTATIONS

[NOTE: the following text is required verbatim]
The Laboratory shall prepare detailed briefings for presentation to the Federal Project Manager at the NETL facility located in Morgantown, WV or Pittsburgh, PA, or at the Laboratory's Facilities. The Laboratory shall make a presentation to the Federal Project Manager at a project kick-off meeting held within 90 days of project start date. Presentation materials shall be provided to the Federal Project Manager as needed for internal NETL use or DOE Office of Fossil Energy Headquarters use. The Recipient shall present the project results orally as a presentation or as a poster at annual programmatic workshops, as required.

*****END OF SOPO FORMAT*****

Appendices to the Project Narrative

The following appendices are to be provided and clearly defined by its corresponding heading. Appendices are to be utilized to validate information within the Project Narrative as appropriate and should not be utilized as an extension for information requested to be addressed in the narrative. The font must not be smaller than 11 point SINGLE SPACED. Information in the appendices **WILL NOT** count toward the page limits in the Project Narrative.

- **Bibliography and References Cited Appendix:** Provide a bibliography of any references cited in the Project Narrative. Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. Include only bibliographic citations. Applicants should be especially careful to follow scholarly practices in providing citations for source materials relied upon when preparing any section of the application. In order to reduce the number of files attached to your application, please provide the Bibliography and References Cited information as an appendix to your project narrative. **This appendix will not count in the project narrative page limitation.**

- **Facilities & Other Resources Appendix:** This information is used to assess the capability of the laboratory resources available to perform the effort proposed. Identify the facilities to be used (e.g., Laboratory, Computer, Office, Clinical, and Other). If appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Describe other resources available to the project (e.g., machine shop, electronic shop) and the extent to which they would be available to the project. In order to reduce the number of files attached to your application, please provide the Facility and Other Resource information as an appendix to your project narrative. **This appendix will not count in the project narrative page limitation.**

- **Equipment Appendix:** List major items of equipment already available for this project and, if appropriate identify the location and pertinent capabilities. In order to reduce the number of files attached to your application, please provide the Equipment information as an appendix to your project narrative. **This appendix will not count in the project narrative page limitation.**

- **Senior/Key Personnel Appendix:** A senior/key person is any individual who contributes in a substantive, measurable way to the scientific/technical development or execution of the project, whether or not a salary is proposed for this individual. **No subrecipients or consultants are permitted in this Research Call.** For each senior/key person provide a biographic sketch that does not exceed 2 pages when printed on 8.5" by 11" paper with 1-inch margins (top, bottom, left and right) with the font not smaller than 11 point. **This appendix will not count in the project narrative page limitation.**

(End of Project Narrative)

1C. Project Management Plan File - (File name: PMP.pdf)

Project Management Plan

The Project Management Plan (PMP) **should not exceed 20 pages, single spaced**, and must be compiled according to the following format:

********** *BEGINNING OF FORMAT FOR PMP* ***********

Title Page:

PROJECT MANAGEMENT PLAN
{Date Prepared}

SUBMITTED UNDER RESEARCH CALL TO DOE LABORATORIES

Fiscal Year 2018
Technical Support for Advanced Air Separation Concepts and Technologies for the Production of Oxygen

"TITLE OF PROPOSAL"

SUBMITTED BY

{Laboratory Name}
{Laboratory Address}
{City, State, Zip Code}

PRINCIPAL INVESTIGATOR

{Name}
{Phone Number}
{E-mail}

SUBMITTED TO

U.S. Department of Energy
Office of Fossil Energy
National Energy Technology Laboratory

(End of Title Page)

This plan should be formatted to include the following sections with each section to include the information as described below:

A. Executive Summary: Provide a description of the project that includes the objective, project goals, and measurable expected results. For purposes of the application, this information is included in the Project Narrative and should be simply copied to this document for completeness, so that the Project Management Plan is a stand-alone document.

B. Risk Management: Provide a summary description of the proposed approach to identify, analyze, and respond to perceived risks associated with the proposed project. Project risk events are uncertain future events that, if realized, impact the success of the project. As a minimum, using the tabular format provided in Table 1 below, include the initial identification of significant technical, resource, and management issues that have the potential to impede project progress and strategies to minimize impacts from those issues.

Table 1 – Project Risks and Mitigation Strategies

Description of Risk	Probability (Low, Moderate, High)	Impact (Low, Moderate, High)	Risk Management Mitigation and Response Strategies
Technical Risks:			
Resource Risks:			
Management Risks:			

C. Milestone Log: Provide a minimum of two milestones for each fiscal year of the project. Each milestone should include a title and planned completion date and a description of the method/process/measure used to verify completion. Milestones should be quantitative and show progress toward project goals.

[Note: During project performance, the Recipient will report the Milestone Status as part of the required Quarterly Report. The Milestone Status will present actual performance in comparison with Milestone Log, and include:

(1) the actual status and progress of the project,
(2) specific progress made toward achieving the project's milestones, and,
(3) any proposed changes in the project's schedule required to complete milestones.]

The format for the Milestone Log is shown in Table 2. The Milestone Log shall include the milestones shown below, in addition to the milestones developed in the proposal. The applicant shall

report progress against the Milestone Log in the Quarterly Reports throughout the duration of the award.

Table 2 – Milestone Log

Fiscal Year	ID	Task Number	Description	Planned Completion Date	Actual Completion Date	Verification Method
1	M1	1	Updated Project Management Plan	XX/XX/20XX		Project Management Plan file
1	M2	1	Kickoff Meeting	XX/XX/20XX		Presentation file

D. Costing Profile: Provide Project Costing Profile Table (See Table 3) that projects, by quarters, the planned expenditure of government funds for the first fiscal year. This table shall be populated in the Quarterly Reports with the actual costs and the variance.

Table 3– Quarterly Project Costing Profile

	Fiscal Year 1							
	10/1/2018 – 12/31/2018		1/1/2019 - 3/31/2019		4/1/2019 – 6/30/2019		7/1/2019 – 9/30/2019	
	Q1	Total Project	Q2	Total Project	Q3	Total Project	Q4	Total Project
Planned Costs								
Actual Costs								
Variance								

E. Project Timeline: Provide a timeline of the project (similar to a Gantt chart) broken down by each task and subtask, as described in the Statement of Project Objectives. The timeline should include for each task, a start date and end date. The timeline should show interdependencies between tasks and include the milestones that are identified in the Milestone Log (Section C).

F. Success Criteria at Decision Points: Provide success criteria for each decision point in the project, including go/no-go decision points (if applicable) and for each fiscal year. The success criteria should be objective and stated in terms of specific, measurable, and repeatable data. Usually, the success criteria pertain to desirable outcomes, results, and observations from the project.

Success Criteria are not deliverables such as reports. Success Criteria are different than milestones in that milestones typically show progress through the execution of the fiscal year and project, whereas success criteria are used by the DOE to determine if specific goals and objectives were met. Typically, these goals and objectives represent requirements established by the R&D program as evidence of progress in advancing a technology area or scientific/engineering

knowledge. The success criteria may be used to assist DOE in deciding whether to proceed to the subsequent fiscal years if required.

G. **Revision History:** This section shall provide the revision history of the Project Management Plan. Each revision shall be accompanied by a detailed explanation and the date of the change. Each revision shall be identified by a new revision letter - the revision letter on the title page shall be incremented accordingly. Examples of reasons for revision include amendments or modifications to the award that change the approved budget, project schedule and/or SOPO, changes to the organizational structure, etc. All revisions require the concurrence of the DOE Federal Project Manager. (In practice, the PMP is to be maintained as a Word.doc and all requested changes to this document are to be made via track changes to clearly highlight the modifications requested when delivered to the Federal Project Manager for review and approval.)

[Note: As the first task in the Statement of Project Objectives, successful applicants will revise the version of the Project Management Plan that is submitted with their applications by including details from the negotiation process. This Project Management Plan will be updated by the Recipient as the project progresses, and the Recipient must use this plan to report schedule and budget variances.]

***** *END OF FORMAT FOR PMP* *****

1.D Data Management Plan – (File name: DataPlan.pdf)

The Data Management Plan must not exceed six (6) pages when printed using standard 8.5" by 11" paper with 1-inch margins (top, bottom, left, and right) single spaced. EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. The font must not be smaller than 11 point. Do not include any Internet addresses (URLs) that provide information necessary to review the proposal. See Part VIII.D for instructions on how to mark proprietary proposal information.

Laboratories are required to submit a Data Management Plan. The Data Management Plan outlines the proposed plan for data sharing or preservation. Guidance for preparing a Data Management Plan is included in Attachment 1 of the Research Call.

In addition to the guidelines set forth in Attachment 1, the Data Management Plan should include: (1) a description of the types of data that will be generated under this project, (2) a description of the types of data that will be made publicly available, and (3) a description of any restrictions that will be placed on the data. If software is anticipated to be developed under the award, the Data Management Plan should also include a plan for its distribution (e.g., open source or commercial licensing).

1.E Budget Justification (File name: BudgetJustification.xls or BudgetJustification.xlsx)

Laboratories are required to provide a detailed budget justification for the proposed project which contains the level of detail contained in the embedded file below. Laboratories are encouraged to use this spreadsheet for their budget.

Budget
Justification File ON

1.F Field Work Proposal (FWP) (File name: FWP.pdf)

A DOE Lab must obtain the approval of its cognizant DOE Contracting Officer to submit a proposal under this Research Call. The approval must be in writing and submitted with the proposal. In order to expedite the award process for the selected Laboratories, all proposals are required to submit a Field Work Proposal for their proposed research work. The DOE Field Work Proposal form is available at https://www.directives.doe.gov/directives-documents/0412.1-BOrder-A-admchg1.

2. SUMMARY OF REQUIRED FILES

The proposal must include the following documents:

Item	Name of Document	Format
1A	Project Summary/Abstract	PDF
1B	Project Narrative, including required appendices	PDF
1C	Project Management Plan	PDF
1D	Data Management Plan	PDF
1E	Budget Justification	Excel
1F	Field Work Proposal	PDF

B. SUBMISSION DATES AND TIMES

Proposal Files must be submitted electronically to the following email address (AirSeparation.LabCall@netl.doe.gov) **no later than July 16, 2018 at 11:59:59 PM Eastern Time. PROPOSALS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

SECTION V – PROPOSAL REVIEW INFORMATION

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the applicant is eligible for an award; (2) the information required by the Research Call has been submitted; and (3) the proposal is responsive to the objectives of this Research Call. Proposals that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

2. Merit Review Criteria (MRC)

Proposals submitted in response to this Research Call will be evaluated and scored in accordance with the criteria and weights listed below:

MRC 1: Scientific and Technical Merit (45%)

- Thoroughness of the description of the proposed technology and degree to which proposed technology or methodology meets the stated goals and objectives of the Research Call.
- Degree to which the proposed research will make progress on existing concepts and why it is needed now relative to prior work.
- Degree to which the proposed work is based on sound scientific and engineering principles.
- Likelihood of successfully developing the proposed technology.
- Anticipated benefits of the proposed work in comparison to current commercial and emerging technologies for use in small-scale power plants.

MRC 2: Technical Approach and Project Management (20%)

- Adequacy and feasibility of the Applicant's approach to achieving the objectives of the Research Call.
- Feasibility, appropriateness, rationale, and completeness of the proposed Statement of Project Objectives (SOPO), such that there is a logical progression of work expected to lead to reduced costs for technology development.
- Adequacy and completeness of the Project Management Plan (PMP) in establishing baselines (technical scope, budget, and schedule) and in managing project performance relative to those baselines.

MRC 3: Technical and Management Capabilities (35%)

- Credentials, capabilities, and experience of key personnel in the technology areas addressed in the proposal and in managing similar projects.
- Clarity and likely effectiveness of the project organization including availability of personnel, facilities, and equipment to perform project tasks.

3. Other Selection Factors

Program Policy Factors

In addition to the Merit Review Criteria, the Selection Official may consider the following program policy factors in determining which proposal to select for award negotiations:

- It may be desirable to select for award a group of projects, which represents a diversity of technical approaches and methods.
- It may be desirable to support complementary and/or duplicative efforts or projects, which, when taken together, will best achieve the program's research goals and objectives.
- It may be desirable, because of the type of projects envisioned, or limitations of past efforts, to select for award a project or group of projects with a broad or specific geographic distribution.
- It may be desirable to select a project for award of equal or less technical merit than another project(s), if such a selection will optimize use of available funds by allowing more projects to be supported while not being detrimental to the overall objectives of the program.
- It may be desirable to select a project for award of equal or less technical merit than another project(s), if such a selection presents lesser schedule risk, lesser budget risk, lesser technical risk, or lesser environmental risks.

SECTION VI – AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

Notice of Selection

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. DOE anticipates notifying Laboratories selected for award by **August 15, 2018** and making awards by **September 30, 2018**.

Non-selected Notification

Organizations whose applications have not been selected will be advised as promptly as possible.

SECTION VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the Research Call must be submitted by email to AirSeparation.LabCall@netl.doe.gov.

Questions and comments concerning this Research Call shall be submitted not later than three (3) business days prior to the proposal due date. Questions submitted after that date may not allow the Government sufficient time to respond.

B. AGENCY CONTACT

Name: Diane Revay Madden
E-mail: Diane.Madden@netl.doe.gov

As stated in paragraph A, questions must be submitted through AirSeparation.LabCall@netl.doe.gov, as appropriate, and shall **not** be submitted to the Agency Contact.

SECTION VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this Research Call will be posted on the NETL Business website at https://www.netl.doe.gov/business/solicitations. There will be no email notifications when a modification or an announcement message is posted. Therefore, it is recommended that you visit the NETL website regularly to ensure you respond to the latest version of this Research Call.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all proposals received in response to this research call and to select any proposal, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

Funding for all awards are contingent upon the availability of funds appropriated by Congress for the purpose of this program and the availability of future-year budget authority.

D. PROPRIETARY PROPOSAL INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, the disclosure of which may harm the Laboratory, should be included in a proposal when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the proposal which are to be restricted:

"The data contained in pages [*Insert pages*] of this proposal have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this Laboratory receives an award as a result of or in connection with the submission of this proposal, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the Laboratory."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of Laboratory) requests not be released to persons outside the Government, except for purposes of review and evaluation."

Laboratories shall <u>NOT</u> identify the entire Project Narrative as proprietary and shall only identify those specific pages and lines that do indeed contain proprietary information.

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct routine, nondiscretionary administrative activities. The Laboratory, by submitting its proposal, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign a conflict of interest and non-disclosure agreement prior to reviewing a proposal. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

SECTION IX APPENDICES/REFERENCE MATERIAL

Attachment 1 – Data Management Plan Instructions

ATTACHMENT 1 – Data Management Plan (DMP) Instructions

A data management plan (DMP) explains how data generated in the course of the work performed under this award will be shared and preserved or, when justified, explains why data sharing or preservation is not possible or scientifically appropriate.

DMP Requirements

In order for a DMP to be considered acceptable, the DMP must address the following:

At a minimum, the DMP must describe how data sharing and preservation will enable validation of the results from the proposed work, or how results could be validated if data are not shared or preserved.

The DMP must provide a plan for making all research data displayed in publications resulting from the proposed work digitally accessible at the time of publication. This includes data that are displayed in charts, figures, images, etc. In addition, the underlying digital research data used to generate the displayed data should be made as accessible as possible in accordance with the principles stated above. This requirement could be met by including the data as supplementary information to the published article, or through other means. The published article should indicate how these data can be accessed.

The DMP should consult and reference available information about data management resources to be used in the course of the proposed work. In particular, a DMP that explicitly or implicitly commits data management resources at a facility beyond what is conventionally made available to approved users should be accompanied by written approval from that facility. In determining the resources available for data management at DOE User Facilities, researchers should consult the published description of data management resources and practices at that facility and reference it in the DMP.

The DMP must protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security (e.g., protected critical infrastructure information -- PCII); recognize proprietary interests, business confidential information, and intellectual property rights; avoid significant negative impact on innovation, and U.S. competitiveness; and otherwise be consistent with all laws (e.g., export control laws), and DOE regulations, orders, and policies.

Data Determination for a DMP

The Principal Investigators should determine which data should be the subject of the DMP and, in the DMP, propose which data should be shared and/or preserved in accordance with the DMP Requirements noted above.

For data that will be generated through the course of the proposed work, the Principal Investigator should indicate what types of data that DOE should be able to release immediately (referred to as "unlimited rights data"). Similarly, for proprietary data developed outside of the proposed work at private expense that will be used in the course of the proposed work (referred to as "limited rights data"), the Principal Investigator should indicate whether that type of data will be subject to public release or kept confidential. Any use of limited rights data must be consistent with the DMP Requirements noted above.

Suggested Elements for a DMP

The following list of elements for a DMP provides suggestions regarding the data management planning process and the structure of the DMP:

- Data Types and Sources: A brief, high-level description of the data to be generated or used through the course of the proposed work and which of these are considered digital research data necessary to validate the research findings or results.

- Content and Format: A statement of plans for data and metadata content and format including, where applicable, a description of documentation plans, annotation of relevant software, and the rationale for the selection of appropriate standards. Existing, accepted community standards should be used where possible. Where community standards are missing or inadequate, the DMP could propose alternate strategies for facilitating sharing and should advise the sponsoring program of any need to develop or generalize standards.

- Sharing and Preservation: A description of the plans for data sharing and preservation. This should include, when appropriate: the anticipated means for sharing and the rationale for any restrictions on who may access the data and under what conditions; a timeline for sharing and preservation that addresses both the minimum length of time the data will be available and any anticipated delay to data access after research findings are published; any special requirements for data sharing, for example, proprietary software needed to access or interpret data, applicable policies, provisions, and licenses for re-use and re-distribution, and for the production of derivatives, including guidance for how data and data products should be cited; any resources and capabilities (equipment, connections, systems, software, expertise, etc.) requested in the research proposal that are needed to meet the stated goals for sharing and preservation (this could reference the relevant section of the associated research proposal and budget request); and whether/where the data will be preserved after direct project funding ends and any plans for the transfer of responsibilities for sharing and preservation.

- Protection: A statement of plans, where appropriate and necessary, to protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, business confidential information, and intellectual property rights; and avoid significant negative impact on innovation, and U.S. competitiveness.

- Rationale: A discussion of the rationale or justification for the proposed data management plan including, for example, the potential impact of the data within the immediate field and in other fields, and any broader societal impact.

Additional Guidance

In determining which data should be shared and preserved, researchers must consider the data needed to validate research findings as described in the Requirements, and are encouraged to consider the potential benefits of their data to their own fields of research, fields other than their own, and society at large.

DMPs should reflect relevant standards and community best practices and make use of community accepted repositories whenever practicable.

Costs associated with the scope of work and resources articulated in a DMP may be included in the proposed research budget as permitted by the applicable cost principles.

To improve the discoverability of and attribution for datasets created and used in the course of research, DOE encourages the citation of publicly available datasets within the reference section of publications and the identification of datasets with persistent identifiers such as Digital Object Identifiers (DOIs). In most cases, DOE can provide DOIs free of charge for data resulting from DOE-funded research through its Office of Scientific and Technical Information (OSTI) DataID Service.

Definitions

Data Preservation: Data preservation means providing for the usability of data beyond the lifetime of the research activity that generated them.

Data Sharing: Data sharing means making data available to people other than those who have generated them. Examples of data sharing range from bilateral communications with colleagues, to providing free, unrestricted access to anyone through, for example, a web-based platform.

Digital Research Data: The term digital data encompasses a wide variety of information stored in digital form including: experimental, observational, and simulation data; codes, software and algorithms; text; numeric information; images; video; audio; and associated metadata. It also encompasses information in a variety of different forms including raw, processed, and analyzed data, published and archived data.

Research Data: The recorded factual material commonly accepted in the scientific community as necessary to validate research findings, but not any of the following: preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, or communications with colleagues. This 'recorded' material excludes physical objects (e.g., laboratory samples).

Research data also do not include:

(A) Trade secrets, commercial information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

(B) Personnel and medical information and similar information the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.

Validate: In the context of DMPs, validate means to support, corroborate, verify, or otherwise determine the legitimacy of the research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; or by some other means.